

### Claim Amendments

Claim 1 (currently amended): A time alignment system for a scanner comprising:

a radioactive source which decays by emitting positrons;

means of detecting the emission of a positron, and producing a signal at the time ~~[[of]]~~ when the radioactive decay of the source decays by the emission of the positron; and

means of converting the signal into a common reference clock for calibration of the scanner.

Claim 2 (original): A system as described in Claim 1 wherein the radioactive source emits positrons and has a half-life longer than six months.

Claim 3 (currently amended): A system as described in Claim 2 wherein the radioactive source is surrounded by the means of detecting and producing a signal when the positron is emitted, wherein the means of detecting and producing a signal is a medium capable of detecting when the source decays by positron emission and before the positron

combines with an electron and they annihilate subsequently producing two gamma rays which may be detected by the scanner's detectors.

Claim 4 (original): A system as described in Claim 3 wherein the medium is coupled to means of converting the detection into an electronic timing signal.

Claim 5 (original): A system as described in Claim 4 wherein the timing signal is used as a timing reference for the scanner's gamma ray detectors.

Claim 6 (original): A system as described in Claim 5 wherein the timing reference serves as a system clock during the timing alignment of all the detectors such that they may all aligned to this common reference clock.

Claim 7 (original): A system as described in Claim 6 wherein all the scanner's gamma ray detectors may be aligned simultaneously to the common system clock.

Claim 8 (previously presented): A system as described in Claim 7 wherein the source remains stationary near the centre of the scanner during the alignment procedure, since the gamma rays are emitted isotropically.

Claim 9 (original): A system as described in Claim 8 wherein the source includes a layer of a positron emitting isotope.

Claim 10 (previously presented): A system as described in Claim 9 wherein the medium is a cylinder of plastic scintillator, and the layer is placed on an inner surface of the cylinder.

Claim 11 (previously presented): A system as described in Claim 10 wherein the cylinder comprises two pieces which are fixed together.

Claim 12 (previously presented): A system as described in Claim 11 wherein the means of converting the detection into an electronic timing signal is a photomultiplier that is coupled to the two pieces.

Claim 13 (original): A system as described in Claim 12 wherein the photomultiplier has an anode output which produces the signal whose amplitude is proportional to the positron energy each time a positron is detected.

Claim 14 (currently amended): A time alignment method for a scanner comprising the steps of:

placing a radioactive source which decays by emitting positrons in a generally central location in the scanner;

detecting the emission of a positron, and producing a signal at the time [[of]] when the radioactive decay of the source decays by the emission of the positron; and

converting the signal into a common reference clock for calibration of the scanner.